

REMARKS

Claims 1-2 and 4-7 are pending in this application. By this Amendment, claims 1, 4 and 7 are amended and claim 3 is canceled without prejudice to or disclaimer of the subject matter disclosed therein. Reconsideration of the application is respectfully requested.

Applicant thanks the Examiner for the indication that claim 7 is allowable.

The Office Action rejects claims 1, 3 and 5 under 35 U.S.C. §102(b) over Nishizawa et al. (U.S. Patent No. 5,355,235); claim 4 under 35 U.S.C. §103(a) over Nishizawa in view of Afzali-Ardakani et al. (U.S. Patent No. 6,963,080); and claim 6 under 35 U.S.C. §103(a) over Nishizawa in view of Bai et al. (U.S. Patent Application Publication No. 2004/0222412). The rejections are respectfully traversed.

In particular, none of the applied references, alone or in combination, disclose or suggest a field effect transistor that includes a gate electrode, a source electrode, a drain electrode, an insulation layer formed between the gate electrode and the source electrode, a semiconductor layer, and a functional layer, the functional layer being arranged between the semiconductor layer and the insulating layer, wherein the electron acceptor is a π -conjugate molecule composed of an ethylene molecule or a π -conjugate structure whose carbon number is 3 to 15 to which at least one group of -CN, -NO₂, -F, -Cl, -Br, -I, and =O is linked, as recited in independent claim 1.

Nishizawa teaches an organic field effect element having a large ON/OFF current ratio (Abstract). Moreover, Nishizawa teaches an organic field effect transistor with an organic semiconductor layer 13 that includes carrier holes in high concentration, and when the gate voltage is applied to the gate electrode 12, the first organic layer 16 receives carrier holes from the second organic layer 13 to form a channel (col. 8, lines 59-68). Accordingly, if an insulating layer was inserted between the first organic layer 16 and the second organic layer 13, then the carrier holes could not travel between the first organic layer 16 and the

second organic layer 13. Thus, Nishizawa teaches away from inserting an insulation layer between the gate electrode and the source electrode, as recited in independent claim 1. Thus, under *In Re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983), because Nishizawa teaches away from this feature, it would be improper to rely on Nishizawa or to combine Nishizawa with other references to arrive at the subject matter of the claimed invention.

Furthermore, the Office Action implies that the insulation layer is in fact the second organic layer 13 of Nishizawa (Office Action, page 2, lines 13 and 14). Applicant respectfully disagrees. In particular, the conductivity of the second organic layer 13 of Nishizawa is high enough to act as a conductor between the source electrode 14 and the drain electrode 15, and thus acts as a Schottky barrier between the first organic layer 16 and the source electrode 14 and drain electrode 15 (Col. 6, lines 7-10). Moreover, Nishizawa teaches that when the source and drain electrodes do not easily form a junction with the second organic layer, an insulating layer may be formed between the source and drain electrodes and the second organic layer (col. 6, lines 34-38). Nishizawa further teaches that if the insulating layer is formed when the junction is not easily formed, short circuit between the source and drain electrodes through the second organic layer can be prevented (col. 6, lines 38-41). Thus, it appears that Nishizawa clearly implies that the insulating layer is not the organic semiconductor layer 13, but is an additional layer that may be provided when the source and drain electrodes do not easily form a junction with the second organic layer 13, contrary to what was originally indicated by the Patent Office. A closer examination of Nishizawa reveals that Nishizawa teaches that the second organic semiconductor layer 13 contains dopants such as I₂ and has a high conductivity (col. 4, lines 19-60), and thus cannot be an insulating layer.

Moreover, Nishizawa fails to show a functional organic layer that comes in contact with the semiconductor layer and contains electron acceptors arranged between the semiconducting layer and the insulating layer (Fig. 1, insulating film 13).

For at least these reasons, Nishizawa fails to disclose or render obvious the features of independent claim 1.

With respect to claim 2, the Patent Office indicates that Nishizawa discloses the subject matter of claim 2 because Nishizawa teaches that the second organic layer has a carrier concentration that is different from that of the first organic layer (Office Action, page 3, lines 8-11). However, although the Patent Office seems to imply that it is inherent that Nishizawa teaches the subject matter of claim 2 because the carrier concentration is different between the second organic layer and the first organic layer, applicant respectfully disagrees. The fact that the carrier concentration is different between the second organic layer and the first organic layer does not necessarily mean that the specific half-wave reduction potential of the electron acceptor is -0.46 V or higher, as recited in claim 2. Thus, claim 2 is patentable over Nishizawa.

With respect to claim 5, the Office Action indicates that the thickness of the second organic layer 13 is between 0.5 and 500 nm and relies on col. 8, lines 38-41 of Nishizawa, which teaches that the second organic layer 13 has a thickness of 200 nm. However, as indicated above, the second organic layer 13 is not a functional layer as claimed in independent claim 1. Thus, Nishizawa fails to disclose or suggest the features of claim 5.

Afzali-Ardakani teaches thin film transistors in which the active channel layer is a thin film of polycyclic aromatic compound prepared by solution processing a soluble precursor on a substrate followed by heating to a moderate temperature (Abstract).

Bai teaches organic polymers for use in electronic devices wherein the polymer includes repeat units of a formula including H, an aryl group, Cl, Br, I or an organic group that includes a cross-linkable group (Abstract).

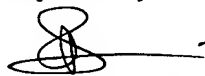
However, none of these references cure deficiencies in Nishizawa in disclosing or rendering obvious the features of claims 4 and 6, including the features of independent claim 1.

For at least these reasons, independent claim 1, and its dependent claims, are patentable over a combination of the applied references. Thus, withdrawal of the rejections of the claims under 35 U.S.C. §102(b) and 35 U.S.C. §103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-2 and 4-7 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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